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THE
ECCALEOBION,

A TREATISE ON

ARTIFICIAL INCUBATION,

AND THE

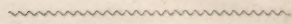
GENERAL MANAGEMENT OF POULTRY.



"Brought into being and nurtured by other powers and agencies than those of nature's providing, the embryo of existence lives."

"'Tis God!

Inspiring God! Who, boundless spirit all,
And unremitting energy, pervades,
Adjusts, sustains, and agitates the whole
He ceaseless works alone, and yet alone
Seems not to work; with such perfection framed,
Is this complex, stupendous scene of things."



PHILADELPHIA:

PRINTED FOR THE AUTHOR, AND SOLD AT THE EXHIBITION ROOM,
BROADWAY, CORNER OF CHAMBERS STREET.

Price Six and a Quarter Cents.

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1844.

THE

EXHIBITION

A TREATISE ON

ARTIFICIAL INCUBATION

AND THE

CENTRAL MANAGEMENT OF POULTRY

By J. B. HENNING, D. V. M., and J. B. HENNING, D. V. M.,
of the University of Pennsylvania.

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EXHIBITION.

THE most extraordinary and wonderful Exhibition of the production of Animal Life to an indefinite extent, by machinery, with all its accompanying and most interesting phenomena, is now open to the public, from 9 o'clock, A. M., to half past 6, P. M. daily.

The average number of birds capable of being daily brought into existence by this machine is about 50, or 20,000 per annum.

By a judicious variation of the temperature, over which this machine has unlimited control, the eggs of any bird, from a Canary to an Ostrich, may be elicited into life, but only those of the common Hen, the Duck, Goose, Turkey, Guinea Fowl, Peacock, and some few others, can be successfully experimented upon at the same temperature. Persons bringing the eggs of any of these birds, or of the Pheasant and Partridge, may have them placed in the Great Life Producing Machine, marked with their initials, on payment of 12½ cents for each egg.

Persons desirous of seeing a bird at any period of incubation, will have an egg broken for them, and will be supplied with a strong magnifying glass, upon payment of 25 cents per egg.

Physicians, Medical Students, and Gentlemen of Science, desirous of investigating the progress of nature in the process of incubation, from the first microscopic speck of vital existence, to its full development in a perfect and healthy being, may receive a Ticket of Admission for twenty-one days, with the privilege of breaking an egg each day, for five dollars.

Parents and guardians of youth, desirous that their charge should behold this secret working of an Almighty Hand, will have an allowance made according to the numbers admitted. Schools, also, will be allowed to view the whole process of incubation upon liberal terms.

Eggs, in any stage of incubation, and young birds, supplied for Philosophical or Anatomical purposes, in any quantity.

Having liberated themselves from the shells, and in the full enjoyment of health and strength, these beautiful and curious birds are sold to visitors, as pleasing memorials of what Science can achieve, at 25 cents each. Warmth, dryness, proper food and common care, are all that is necessary to rear them successfully.

A DESCRIPTION OF THE ECCALEOBION, DETAILING THE PROGRESS OF INCUBATION.

ECCALEOBION, the name or title of this Machine, is derived from two Greek words, *Εκκαλέω*, "I bring forth," and *Βίος*, "life,"—forming the compound Eccalebion, signifying, "I bring forth life."

The Eccalebion, or Life Producing Machine, forms, to outward appearance, an oblong box, four feet six inches long, three feet eight inches high, and three feet six inches wide. It stands out from and is disconnected with the walls of the room, and its efficient action and regulative powers are enclosed within the case. It contains nearly one thousand eggs, and is divided into eight compartments, or divisions, open to the sight (the doors being glazed,) in which the eggs are deposited, spread promiscuously upon the floor of each division. The eggs lie uncovered, neither wrapped in flannel, nor immersed in sand, as has usually been done, in order that they might retain their warmth when exposed to cold, or resist the effects of too great heat.

The spectacle of so many living beings, busily employed liberating themselves from their imprisonment, and bursting into light and existence, through the agency of inert matter, set in operation by the human mind, presents a sight most beautiful and interesting. At this period, the assistance of the machine is not absolutely necessary—it may be done upon a table, or in the hand, a warm temperature being all that is required.

From this machine the birds come forth healthy, strong and active. Soon after their liberation from the shell, they require to be carefully fed and tended for two or three days, after which, revelling in the luxury of their new existence, they may be seen running about the floor of their apartment, and proper means being used, neither require nor feel the loss of that care which, in all other cases, a maternal parent only can bestow.

Birds in a healthy condition require no aid to effect their escape from the shell; accomplishing their freedom themselves in a remarkably uniform manner, making a circular fracture with their bill, and bursting the integuments of the shell by strong muscular exertion.

Few eggs, except those of rare or foreign birds, are worth the trial of hatching, if more than a month old; their condition, however, is greatly influenced by the weather—very hot weather destroying vitality in a few days.

This machine does not, as is frequently the case with eggs set upon by the parent bird, ever addle them. This evil is occasioned by the alternation of heat and cold, arising from the hen's unsteady sitting. The warmth imparted by the machine is uniform and continued.

Failures, however, arise from the following causes:—viz: Want of impregnation in the egg; age, commonly called staleness, whereby life has become extinct; weakness of the vital energy of the egg, produced by old age, lowness of keep, or ill health of the parent; in these cases, the embryo partially develops itself, but dies before the full period of incubation.

Eggs may be hatched by other means, but if the process be not properly executed, the young birds are weakly and soon die. The operation, how-

ever, by this machine is so certain, and so completely under control, that the birds produced by it come forth in the most healthy state, and live, flourish and fatten, as well as any other of their species who owe their existence to a more natural and less extraordinary birth.

There is no difficulty in teaching the young of the various tribes of gallinaceous fowl to eat and drink; they perform these operations spontaneously, or from observation, as appetite prompts them, nor is food necessary till 12 or 20 hours after they are hatched. Sickly and badly hatched birds generally die from inanition.

Beautiful as a brood of chickens always are, when presented to the eye under any circumstances, the interest excited is greatly increased by the artificial system of production and rearing. When but a few hours old they recognize the person who feeds them, and in a few days evince so many and such pleasing traits of confidence in him, as their protector and friend, following his steps and clamorously repining at his absence, as must induce in the most callous breast a delightful sensation of regard for their welfare.

It is not necessary, in the Eccaleobion, to move or turn the eggs for the purpose of subjecting each to its fair proportion of warmth, as the machine acts uniformly, not only with the same power upon the whole surface of each egg, but upon all alike, however great their number. But, to prevent the yolk of weak eggs from settling by its specific gravity, and adhering to the shell, it is useful to pass the hand over them, so as to change their position once in twenty-four hours.

The egg of a strong, healthy bird, at the time of its protrusion from the body, is completely filled with yolk and albumen. If examined, a few days after, by holding it toward the light, a small bladder of air will be discoverable at the larger end, which increases with the age of the egg. This waste of its internal substance is occasioned by absorption by the atmosphere, through the pores of the shell, of the more volatile part of its contents. When the bladder is large in any egg, it is unfit for incubation; nevertheless, in a good egg, as incubation proceeds, this bladder becomes considerable, probably produced both from evaporation by heat, and the vital action going on within the shell. It also serves an essential and important purpose in the economy of this mysterious process.

The germ, or embryo of the chick, contrary to the received opinion, is not in every egg placed precisely in the same situation, but varies considerably. Generally, it develops itself within the circumference of the broadest part of the egg; sometimes it is found higher, sometimes lower; and, when held before a strong light, has an appearance, when a few days old, somewhat resembling the meshes of a spider's web, with the spider in the centre. As it increases in size, the bulk of the contents of the egg decreases, as already stated, so that when the bird is completely matured, it has ample space to move, and to use its limbs with sufficient effect to insure its liberation.

If chickens, about two months old and upwards, are turned in among a brood of younger birds, they will sometimes take to brooding, and tending

them with the delight of natural parents. The gratification being quite mutual, the young chicks run after, and strive with each other for their favors with the most untiring perseverance. Although, probably, it is simply the pleasurable sensation derived from the genial warmth communicated by the young birds nestling under them, which induces them to do it, it is, nevertheless, a striking, and highly interesting picture, to witness these mimic mothers acting the part of foster parents with so much apparent satisfaction, yet with the awkwardness with which a girl, in similar circumstances, fondles her doll.

Are not the facts of the extraordinary fecundity of these tribes of birds, their requiring no assistance in hatching, and their being self-instructed in the manner of taking their food, abundant evidence that an All-wise Providence ordained these peculiarities expressly for man's benefit? In all those families of birds not so fitted for his use, they do not exist; and consequently cannot be rendered, by artificial means, available for the convenience of man.

CHAPTER II.

The following progressive series of phenomena are daily observable during the progress of incubation, in the egg of the common fowl:—In an impregnated egg, previous to the commencement of incubation, a small spot is discernible upon the yolk, composed apparently of a membranous sac or bag, containing a fluid matter, in which swims the embryo of the future chick, and seemingly connected with other vesicles around it.

1st Day. In a few hours after exposure to the proper temperature, the microscope discovers that a humid matter has formed within the limits of the embryo: At the expiration of twelve or fourteen hours, this matter bears some resemblance to the shape of a little head; a number of new vesicles also successively appear, foreshadowing the different parts of the future body of the chick; those first formed, and most easily distinguished, may afterwards be recognized as assuming the shape of the vertebral bones of the back.

2d Day. The eyes begin to make their appearance about the 30th hour, and additional vessels, closely joined together, indicate the situation of the navel. The brain and spinal marrow, rudiments of the wings, and principal muscles, become observable. The formation of the head is also evidently proceeding.

3d Day. The beating of the heart is perceptible, although no blood is visible; after a few hours, however, two vesicles, containing blood, make their appearance. One forming the left ventricle, the other the great artery. The auricle of the heart is next seen, and, in the whole, pulsation is evident.

4th Day. The wings now assume a more defined shape, and the increased size of the head renders the globules containing the brain, the beak and the front and hind part of the head, distinctly visible.

5th Day. The liver makes its appearance, and both auricles, now plainly

seen, approach nearer the heart than before. That splendid phenomenon, the circulation of the blood, is now evident.

6th Day. The lungs and stomach are distinguishable, and the full gush of blood from the heart is distinctly apparent.

7th Day. The intestines, veins, and upper mandible become visible, and the brain begins to assume a distinct form.

8th Day. The beak for the first time opens, and the formation of flesh upon the breast commences.

9th Day. The deposition of matter forming the ribs takes place, and the gall bladder is perceptible.

10th Day. The bile is distinguishable by its green color, and the first voluntary motion of the body of the chick is seen, if separated from its integuments.

11th Day. The matter forming the skull now becomes cartilaginous, and the protrusion of feathers may be noticed.

12th Day. The orbits of sight are apparent, and the ribs are perfected.

13th Day. The spleen gradually approaches to its proper position in the stomach.

14th Day. The lungs become inclosed within the breast.

15th, 16th, and 17th Days. During these days, the infinity of phenomena in this wonderful piece of vital mechanism elaborate it into more perfect form, and it presents an appearance closely approaching the mature state. The yolk of the egg, however, from which it derives its nourishment, is still outside the body.

18th Day. On the eighteenth day, the outward and audible sign of developed life is apparent, by the faint piping of the chick being, for the first time, heard.

19th, 20th, and 21st Days. Continually increasing in size and strength, the remainder of the yolk gradually becomes inclosed within its body; then, with uncommon power, for so small and frail a being, it liberates itself from its prison in a peculiar and curious manner, by repeated efforts made with its bill, seconded by muscular exertion with its limbs, and emerges into a new existence.

The position of the chicken in the shell, is such as to occupy the least possible space. The head, which is large and heavy in proportion to the rest of the body, is placed in front of the abdomen, with its beak under the right wing; the feet are gathered up like a bird trussed for the spit, yet in this singular manner, and apparently uncomfortable position, it is by no means cramped or confined, but performs all the necessary motions and efforts required for its liberation, with the most perfect ease, and that consummate skill which instinct renders almost infallible.

The chicken, at the time it breaks the shell, is heavier than the whole egg was at first.

An egg will not hatch *in vacuo*.

The infinite wisdom of the Great Architect of the Animal frame is remarkably manifested in its providing the chick with a sharp and hard substance on the tip of the bill, by means of which it is enabled to fracture the

shell to liberate itself from its imprisonment. Its own bill is too soft to enable it to break the shell therewith, and in two days or less this hard and pointed substance disappears, the young bird no longer requiring to use it.

Equally extraordinary and wonderful is the fact that the germ of the chick is provided with the ability to keep itself always on the top of the yolk of the egg, to the end that it may take the heat from the parent bird when setting, to produce incubation.

Such is the Exhibition of the *Eccaleobion*! Such the interesting nature of the phenomena displayed by its agency! Phenomena so magnificent and so pregnant with wonders, as to fill with admiration and awe, alike the mind of the profoundest philosopher, and the least contemplative of the human race. Nor is it possible, that the most unintelligent Christian can survey them with indifference, and his reflections thereon not lead him

"Through nature, up to nature's God."

CHAPTER III.

ARTIFICIAL INCUBATION, AS PRACTICED IN EGYPT, AND THE ATTEMPTS MADE IN EUROPE, PARTICULARLY BY THE FRENCH ACADEMY, TO ESTABLISH THE SYSTEM IN FRANCE.

Domestic Poultry, particularly the Gallinaceous kinds, are not only regarded valuable as food from their agreeable flavor, and highly nutritive qualities, but even as luxuries, which, from their scarcity and high price, seldom grace the table of the poor, or in fact of the middling classes. It would therefore be no small achievement to bring an article so desirable within the reach of all, rich or poor. But this can never be accomplished until some means shall be provided of multiplying their numbers, far superior to those heretofore employed.

There is a charm about these tribes of birds which prepossesses every one in their favor, particularly the common cock and hen. Their dauntless courage, especially of the male bird; his noble bearing, his defying notes, and attention to his harem—their affection for their young, their fearlessness of man, and their generous re-payment of his care for them in the shape of eggs and food, render them not only an ornament at the door of the cottage, but the pride of the "good wife," who well knows the value of an egg in the nest when provisions are scarce in the larder. No cottage where there is room for a run, without trespassing upon a neighbor's property, is what it ought to be, if not provided with these interesting appendages.

There have not, however, hitherto existed the means whereby any great increase of our domestic birds could be effected. The Egyptian mode of artificial incubation does not succeed in climates less uniform and favorable for the process. The Egyptians imitate the ostrich; they arrange the eggs in Mammals, or ovens, built in such a manner as to give them the necessary protection from the slight atmospheric changes of their almost unvarying climate: the eggs are covered with sand, an idea borrowed from the ostrich, and a small fire running lengthwise through the different com-

partments, maintained for the first eight or ten days, is sufficient to promote incubation; the loss of heat from radiation during the remaining days of the process, owing to the genial nature of the climate, is so trifling as not to destroy the vitality of the egg.

De Reaumur, in his well known work upon this subject, utters a sentiment to the justness of which every philanthropist will cordially assent.— That “Egypt ought to be more proud of her *mammals* than of her towering pyramids.” It was in the spirit of a truth so beautiful, that the members of the French Academy determined to make experiments in their own country on this Oriental practice. These experiments were placed by the Academy, under the direction of the celebrated De Reaumur, and under the patronage of the Royal family most strenuous exertions were made to establish this ingenious mode of increasing, indefinitely, the quantity of human food, upon the soil of France. It was a subject which excited the most popular enthusiasm; the nobility, gentry and clergy vied with each other in its encouragement.

As might have been expected, those means so well adapted to the steady unchanging climate of Egypt, suited not the varying temperature of France, and after some years of but partial success, it came to be regarded as a project, however beautiful in theory, by no means remunerating in profit.

Under these circumstances, it might seem hopeless again to endeavor to attain an object, apparently suited only to the blandness of an Eastern clime, did not every day's experience prove, that in the present age nothing is beyond the power of genius to overcome; that physical difficulties vanish before the light of mind, and the frost of winter, and the heat of summer, are rendered harmless in their influences, by science commanding the elements of nature to obey her direction, or mould themselves to her bidding. Her magic wand annihilates time and space; the lightning of Heaven is in her hand, and the winds and the waves obey her behest. To revive the Egyptian process would therefore be useless. And the only chance of success would seem to be, by counteracting the changes and variations in the temperature of our climate, which we have at length most effectually accomplished.

The Eccaleobion has the power completely to control temperature, independent of climate, season, or changes in the atmosphere, and is absolutely uninfluenced by them.

By means of this perfect command over temperature, the egg of any bird, not stale, placed within its influence at the proper degree of warmth, is, at the expiration of its natural time, elicited into life without the possibility of failure, which is often the case with eggs subjected to the caprice of their natural parent.

To a successful rearing of a large number of birds artificially, the required essentials are, a sufficient number of these machines, suitable buildings, dry soil, warmth, proper food and careful attention to cleanliness and their usual wants.

By a judicious system of management, suitable buildings being provided, one thousand birds might be kept in the best possible condition, with less

trouble and attendance than a brood of a dozen chickens would require without such measures being taken to rear them.

One great object to be gained by this artificial process is that the poultry will be better and more fresh than that usually brought to market, and the markets can be the most liberally supplied at those seasons when the article is the most scarce and the most inferior in quality. There will always be more or less difficulty, however, in producing large numbers during the three winter months, on account of the scarcity of good and fresh eggs.

PART II.

CHAPTER IV.

GENERAL REMARKS ON THE MANAGEMENT OF POULTRY.

Poultry are subject to a variety of diseases, but nearly all of a serious nature are attributable to the effects of climate or want of care and skill. Pip is caused by a want of clean water, or by drinking dirty water in dry weather. Cure—remove the white blister found upon the tongue, and wash it with warm vinegar and water—feeding the bird for a few days with soaked bran and lettuce, or cabbage chopped very fine.

Flux is cured by pills of the yolk of an egg boiled hard, mixed with bruised hempseed, or boiled barley diluted with wine.

Costiveness, the reverse of the former, is cured by giving them beet root chopped fine, or bran and water with a little honey mixed.

Vermin may be destroyed by fumigating the roots with brimstone.

Scab and Itch are cured by feeding them with moist bran.

Cramp is caused by cold and damp. When afflicted, the birds should not be allowed to roost out of doors, and the roost should be well secured and warm—rub the legs and feet with a little fresh butter.

Abscess frequently comes upon the rump, and is caused by heat of blood, or torpid stomach, which corrupts the mass of blood. Open the abscess and press out the matter. Feed them with chopped beet root or lettuce, with some bran mixed, moistened with honey or molasses and water.

Fowls should not be allowed to roost in very large numbers together, but where great quantities are raised, they should be kept in flocks of not more than one hundred. They should be kept very cleanly.

Warmth, with freedom from damp, is the great secret in the care of fowls. Their food should be frequently changed, and green food often mixed with their meal, shorts or bran. Indian meal and molasses and water will fatten poultry faster than any other food. Cinders should be sifted for them to roll in, which will free them from vermin, and they should never be without a supply of clean water for drinking.

Never give them warm or hot food, which causes them to become crop bound. Hemp and buckwheat, or wheat occasionally, are good stimulants.

So far as food is concerned, every farmer's wife throughout the country knows what is proper. One great danger arises from their voracity of ap-

petite inducing them to eat too much of food too nutritious for their delicate digestive organs, whereby they become sickly, or what is commonly called crop-bound. Simple as the remedy for this evil may appear, it is somewhat difficult to put in practice where large numbers are fed together.

As regards attention to cleanliness, and their other common wants, such as regularity of feeding, and an abundant supply of pure water, nothing need be said; they can scarcely live, certainly not flourish, without these necessary requirements being strictly attended to.

Under, however, the best management, and the greatest precautions used against their various ailments, many will perish. It is a truth, however, that almost all the diseases of poultry arise from atmospheric causes.

With respect to medical treatment, applied to the diseases of poultry, but little regarding its efficacy is known. The nostrums and mode of treatment adopted throughout the country, together with the greater part of what has been written upon the subject, is a farrago of nonsense and absurdity. If shelter, warmth, food and cleanliness, congenial to their habits, will not preserve them in health, but little reliance can be placed upon medicine.

Great care is necessary to protect poultry from the ravages of the Skunk, the Muskrat, the Fox, and other animals, who possess a taste so refined as to prefer the chicken to coarser food. And to ensure complete success on a large scale suitable buildings should be provided.

A close room, which can be made to exclude the wintry frosts, and also admit the balmy breeze of summer, should be provided for the machines, and should be kept as an Eccleobion Hall. From this hall passages should lead to other rooms less tight and substantial, and many of them should be provided. As the birds grow they should by degrees be moved along, until after six weeks, or thereabouts, they will have an open yard with roosting places under a shed. In this manner, by keeping them in flocks of one or two hundred, and changing their roosting places frequently, by keeping them clean, &c., there will be no difficulty in raising any number per annum, provided no old fowls are kept on the premises. With suitable conveniences there will be less trouble in raising one hundred thousand a year, than in raising one hundred without them.

To a successful rearing, therefore, of a large number of birds by artificial means, the only required essentials are, a sufficient number of these machines; suitable buildings; warmth and protection from dampness; proper food; and a careful attention to cleanliness in all respects. An establishment so constructed and so conducted cannot fail to pay an immense profit to its proprietor.

The best food for chickens until three or four days old is eggs, either stale or fresh, boiled hard and cut into very small pieces. After which, meal wet up, and hominy dry. As they grow older, the feed should be varied, and they should have more or less green food, like lettuce, cabbage, endive, &c., chopped fine, and mixed with their meal; and loppered milk or bonny-clabber is most excellent. Cold boiled potatoes, fresh meat, crusts of bread soaked, and many other things usually thrown to the pigs, are excellent and profitable food for all kinds of gallinaceous fowl.

CONCLUSION.

The Eccaleobion Machine is peculiarly calculated for practical purposes, and whether one desires to produce very large quantities for market, or only a few, this mode of producing them will be found by far the most economical and the most convenient. The American Eccaleobion is entirely different from any thing ever produced in Europe, and infinitely superior for all practical purposes. It possesses a complete and perfect control over temperature, which is the greatest desideratum, and is very compact, containing the hatching ovens, the heating apparatus, the brooding places, &c., all within a space of about three and a half feet square. It is portable and in all respects convenient, and is so systematic in its operation, that if the eggs deposited in it are equally good, they are all equally certain of producing the young; and, when liberated from the shell, they are exempt from nearly all those diseases which are so fatal to young fowls in the farm-yard.

The first cost of a machine capable of holding 800 or 1000 eggs, is \$120, but they are not liable to wear out, and the amount of fuel is so small, being only two barrels of charcoal per month or thereabouts, that it must be admitted to be the most economical method which can be contrived. The machines can be attended by females, or those who, from debility, are incapable of ordinary labor. Should poultry decline in price to about the average of animal food in general, still its production by means of the Eccaleobion cannot fail to be extremely profitable.

It is worthy of remark, that fowls produced by these machines, being free from the ordinary diseases of a farm-yard, arrive at maturity much earlier than those produced in the ordinary way, and are usually fit for the market in ten or twelve weeks. Thus enabling a person to obtain a quick return for his investment of capital. Persons living near a populous town, with a very little land, may produce with these machines a large amount of poultry, and ensure a much increased revenue. The price of the second size, having about one half the capacity of the one above described, will be \$75, but will require more constant attention.

Finally—the idea is quite common that the price of these machines is too high, and that the proprietor endeavors to realize too large a profit upon each machine. But the expense of constructing them is far greater than a superficial observer could suppose. The amount of material alone is very considerable, and the work is of the most difficult and expensive kind, and the proprietor charges only a remunerating profit. They may in time be produced at less expense; but whether they are or not, they must be brought into general use, and those who order machines the soonest, will realize the most profit from the business.